

ABSTRACT OF THE DISCLOSURE

A method and apparatus for reducing conductive thermal losses in high-current cryogenic power electronics systems needing large cables to interface between warm and cold environments. Thermal losses increase with increasing cross-sectional area. The total current at the warm/cold interface is split into many smaller currents by splitting the power buss into a plurality of parallel leads. Respective physical switches in each smaller lead at the interface interrupt current flow, and at the same time open the path for thermal conduction along the lead. When little or no current is flowing through the system, selected smaller leads of the power buss are physically opened by the associated switches to stop the thermal and electrical flow along these leads. Current diverts to another parallel lead in the buss but the cross section for heat flow is reduced at the interface.